



# Aerospace Advisory Committee Meeting

Thursday, April 24, 2008

# California Aerospace A Growth Industry



- # of Jobs
- Volume
- # of Suppliers
- Wages
- Total Economic Impact
- Investment in Education

# California Aerospace



- Largest concentration of aerospace in US in CA
- 6000 aerospace suppliers statewide
- CA's largest employer from aerospace
- Estimated 27% of nation's aerospace
- Estimated 31% of US space/19% of global space
- High-growth, high-wage jobs – entry to PhD, with average wage \$50+K/year
- Positive trade balance
- National security asset

# Aerospace Industry Enabling Other Industries/Services



- Supports key California industries/services
  - Agriculture (precision farming, yield increase)
  - Entertainment (Global news, sports, weather)
  - Telecommunications (global/mobile/cell)
  - IT (aerospace huge software customer)
  - Environmental (ocean/wildlife/pollution monitoring)
  - Public Safety (communications, GPS, storm watch)
  - Homeland Security (airport security, ports)
  - Regional Planning (GIS,
  - Innovation (GPS, CCTV, space tourism)

# California Innovation Corridor Support for ED Commission



- CSA Prog Manager: Corridor DOL WIRED grant through California Labor/Workforce Agency
- Grant includes 25 projects, including
  - Economic Development Innovation Model (Bay Area Council Economic Institute)
  - Asset Inventory
  - *Racing for the Future* Workforce Investment Board toolkit
  - STEM Collaborative Action Plan (California Space Education & Workforce Institute)/STEM Inventory
  - Smart Supplier Initiative (California Space Authority)

# California

## Aerospace Legacy



- Early US aviation companies sprouted near LAX
- First jet engines developed at JPL
- GPS born at Space & Missile Systems Ctr (SMC)
- VAFB built as one of 2 premier US launch sites
- Every Apollo mission engine tested at Edwards AFB
- Shuttle/Int'l Space Station designed/partially built in California
- Mars missions out of JPL
- Aviation testing/testing of major flight vehicles Ames (wind tunnels)/Dryden (protected flight corridor)

# California Aerospace Assets Today



- Three of 10 premier NASA sites in US
  - Ames – working enhancement of US air traffic control
  - JPL – Mars missions, nearly all NASA enviro'l missions
  - Dryden – alternate Shuttle landing site, flight testing
- Major aerospace presence through military bases
- VAFB: US space command/control center; all US environmental launches
- CA presence all major aerospace primes
- 6000 aerospace suppliers
- Mojave Air & Space Port – inland spaceport

# Air & Space Enhancing Quality of Life



- Innovation driver/solutions provider for CA
  - Fire management, conservation and wildlife
  - Environmental monitoring/management/climate change
  - Emergency communications systems
  - Telemedicine, medical robotics, sensors
  - Entertainment/global broadcasting, cinema
  - Climate monitoring, severe weather
  - Water flow/levee/water quality management
  - Tourism: next-generation spaceplane
  - Urban planning
  - Natural resource monitoring



# Aerospace Interface: Other ED Committees



- Agriculture
  - Irrigation management, precision farming, yield increase
- Biotech
  - Space manufacturing, pharmaceutical studies
- Global Goods Movement
  - Container and trucking fleet management, plane and ship tracking, (future) package delivery

# Technical Workforce Crisis Education Challenge



- Boeing\*; CSEWI\*; DOL\*
  - 5% of US workers in STEM; account for 50% of eco impact
  - 1970: US produced 50% of world's science/engineering PhDs. 2010 expectation: US will produce only about 15%
  - California employs 18% of the national science and engineering workforce
  - California produces 9% of the technical graduates
  - Only 4% of California ninth graders complete S&E degree
  - Average aerospace engineer 54 years old
  - 2M science and engineering workers retiring 1998-2008
  - 1.9M new jobs in science and engineering being created over those 10 years

\* *Workforce of the Future* (Boeing); *STEM Collaborative Action Plan* (CSEWI); *STEM Report* (DOL/ETA)

# Education/Workforce Possible Solutions



- Program to recruit industry retirees into teaching (e.g. Encorps, SEARCH etc.)
- Project Lead the Way/MESA programs
- STAR Programs (Science Tchr & Rschr)
- Aerospace academies
- Implementation of STEM Collaborative Action Plan (WIRED) recommendations statewide

# Education/Workforce Possible Solutions (2)



- Support for Career Technical Education
  - Support State/Local education reforms to make CTE an integral part of every student's education
- Implementation of *Racing for the Future* – Workforce Investment Board toolkit (WIRED)

# Competitiveness Barriers



- Other states/countries recruiting CA aerospace to enhance their innovation, global competitiveness (FL, MS, TX, Canada, etc.)
- Cost of living
- Cost of doing business (estimated 30% higher than other states)
- Lack of recognition, appreciation by policymakers
- Few incentives
- Quality of education K-12

# Competitiveness Barriers (cont'd -2)



- Global competition – overseas companies invent what they used to buy, Int'l Traffic in Arms (ITAR) regulations have hurt U.S. competitiveness
- State not aware of federal procurement opportunities, CA benefit, multi-billion DOD impact
- Space enterprise viewed as launch, satellites, ground systems, not including R&D and services it provides
- Aerospace not recognized as major California industry, due to inadequacy of NAICs codes to represent the whole

# Competitiveness Barriers (cont'd – 3)



- Challenges to maintaining CA's edge:
  - Aerospace and Defense funded federally, so no natural loyalty to any particular state, unless ROI
  - Little connection between State and industry, unlike other states which cater to the aerospace industry because of economic value
  - No cohesiveness of CA delegation re: attraction of missions, assets to support California aerospace – other state delegations coalesce to attract programs

# Competitiveness Barriers (cont'd – 4)



- Challenges to maintaining CA's edge (cont.):
  - Finding 21<sup>st</sup> century high tech workforce (see Education/Workforce)
    - Average aerospace worker age 54
    - Fewer qualified graduates
  - Creating entrepreneurial support for innovation
  - No perceived champions for aerospace at this point
  - California not friendly to business – expansion barrier



# Competitiveness Barriers (cont'd – 5)



- Challenges to maintaining CA's edge (cont.):
  - Other states offering customized “can't turn down” incentives (e.g. building a community college next to new company site to provide easy access to training)
  - Manufacturing not supported in California
  - Innovations developed in CA result in manufacturing going elsewhere with bulk of jobs created going out-of-state, with risk of design and development following manufacturing
  - State support not competitive with other states when companies deciding where to locate major programs (calls, visits, incentives developed in cooperation with local community)

# Addressing California Competitiveness



- **RECOGNIZE Aero and Space companies**
  - Gov/Lt. Governor/Legislature - highlight value in speeches, reports, hearings, etc.
  - Establish regular contact with key aerospace corporations
  - Reach out to aerospace entrepreneurs with welcome, support
  - Publicize value of California as U.S. premier aerospace supply center and manufacturing nexus in California ads, marketing

# Addressing California Competitiveness (2)



- **RECOGNIZE Aero and Space companies**
  - Reach out to military base Commanders, base community stakeholders
  - Implement Office of Military and Aerospace Support
  - Reach out to California's three NASA sites (CA has three of 10 premier NASA sites in U.S.)

# Addressing California Competitiveness (3)



- SUPPORT Aero and Space companies
  - Encourage CA State Legislature and CA Federal delegation to champion CA aerospace
  - Provide Gov/Lt. Gov response to aerospace company/mission attraction opportunities, to potential company withdrawals from CA
  - Provide opportunities for top-level conversations between key aerospace corporations and Governor/Lt. Governor

# Addressing California Competitiveness (4)



- SUPPORT Aero and Space companies
  - Explore ways to reduce aerospace operating costs, e.g. could utilizing excess military infrastructure in CA for industrial centers provide economic utility for aerospace?
  - Assist companies doing site searches with multiple California options, especially in less costly areas of California
  - Support mission attraction, e.g. Cyber Command

# Addressing California Competitiveness (5)



- Leverage Aero and Space Technologies to enhance CA's other industries/activities
  - Satellite services, small sats, sat networks - explore utility for State, other CA jurisdictions
  - Suggest aerospace tech solutions for problems of other industries to reduce their costs, improve their performance

# Addressing California Competitiveness (6)



- Leverage Aero and Space Technologies to enhance CA's other industries/activities
  - CSA/AIAA cooperating on report regarding how CA State challenges could benefit from space services/technology (for climate change, environmental management, ag yield, etc.)



# Addressing California Competitiveness (7)



- Keep innovation edge by keeping aerospace, aerospace opportunities in California
  - Provide incentives for CA companies looking for expansion opportunities to consider Central Valley, other economically distressed areas instead of other states
  - Re-institute CA R&D tax credit
  - Create Center for Space Entrepreneurship (CSE) based on CO model (space entrepreneurship training)



# Addressing California Competitiveness (8)



- Keep innovation edge by keeping aerospace, aerospace opportunities in California
  - Consider developing aero and space technology grant programs for innovators
  - Support development or leverage of institutes supporting aerospace technology development
  - Adopt recommendations in OMAS report
  - Support Mojave Air and Space Port for next gen spaceflight

# Addressing California Competitiveness (9)



- Keep innovation edge by keeping aerospace, aerospace opportunities in California
  - Implement Bay Area WIRED study recommendations on creating an innovation culture (economic development innovation model)
  - Introduce permit process refinements to make California friendlier to aerospace/business community
  - Continue to provide state leadership in ITAR reform

# Next Steps



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